

## Pollution Measuring System

Another means of monitoring smokestacks remotely (see opposite page) is the Visiplume system pictured. Visiplume is a portable, microprocessor-controlled air pollution monitor for measuring sulfur dioxide emissions from fossil fuel-fired power plants and facilities that manufacture sulfuric acid. It observes smokestack plumes at a distance from the stack, obviating the expense and difficulty of installing sample collectors in each stack and later analyzing the samples. Invented by Langley Research Center, Visiplume is manufactured under NASA license by Research Ventures Incorporated, Williamsburg, Virginia.

The most widespread type of air pollution is sulfurous smog, which results from discharge into the atmosphere of sulfur bearing compounds, principally sulfur dioxide. Sulfurous smog interacts with aerosols in the air to affect human lungs. Acid rain—precipitation containing sulfuric acids—has been found to kill fish, destroy plant life and erode building materials. Thus, it is important that environmental agencies and private industry carefully monitor

sulfur dioxide emissions to plan corrective measures. Visiplume offers a new, cost-effective means of doing it, and it can also be useful in checking the efficacy of desulfurizing techniques, such as "scrubbing."

Visiplume's major components are an optical "plume viewer" (at top in the photo), an electronics unit including a television monitor, and a power supply. By means of the optical system, Visiplume visualizes the smoke plume, observing the absorption of ultraviolet radiation by sulfur dioxide against a normal sky background. The system measures the concentration of sulfur dioxide in the plume and the velocity of the gas by tracking fluctuations in the concentration; these two inputs allow automatic computation of the emission rate, the ultimate measure of pollution. The TV monitor in the electronics box displays the smoke plume and the locations within the plume where the measurements are taken. Final results are also displayed on the monitor and, for a permanent record of the measurements, Visiplume provides a printer output.

